PS 230
DUAL CHANNEL
REMOTE SPEAKER STATION

USER MANUAL

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1.0 GENERAL DESCRIPTION

The PS 230 is a dual channel speaker station designed for use in an ASL analog intercom system and provides full duplex communications. The unit incorporates a loudspeaker, a gooseneck microphone and a headset connector The PS 230 RM model has, instead of a gooseneck mic, a small built-in electrets mic.

Each channel has Volume (listen level) Control, a TALK and CALL button with LED indicators and a 2-stage side tone trimmer. There is a trimmer for speaker attenuation and one for buzzer volume.

The unit is equipped with a limiter for the gooseneck microphone, allowing the user to speak close into the microphone without giving rise to overload and distortion.

Loudspeaker dimming is automatic if the gooseneck microphone is active.

Private conversation may be carried out via a headset or telephone handset plugged into the headset connector. If a headset is connected, both the gooseneck microphone and speaker are disabled automatically.

The XLR-4 headset connector can be replaced (by ASL) by a XLR-6 connector for binaural use of the headset.

Special attention has been paid to the intelligibility of speech. By applying low noise/high speed op-amps, a speech presence filter and a specially developed high power bridged headphone amplifier, communication is very comfortable even in environments with high back-ground noise level. There is a separate amplifier for the loudspeaker.

The unique ASL CALL system provides both a flashing red LED and a very characteristic sound signal (the buzzer). Smooth operation is guaranteed with the CALL button. Only a slight touch makes the red LED flash, whilst holding the button for two seconds activates the CALL sound signal. The volume of this signal (the buzzer) can be adjusted at the front panel.

Fully electronic switching allows for 'soft' microphone on switching (latching or momentary), remote Mic Mute facility and automatic speaker attenuation.

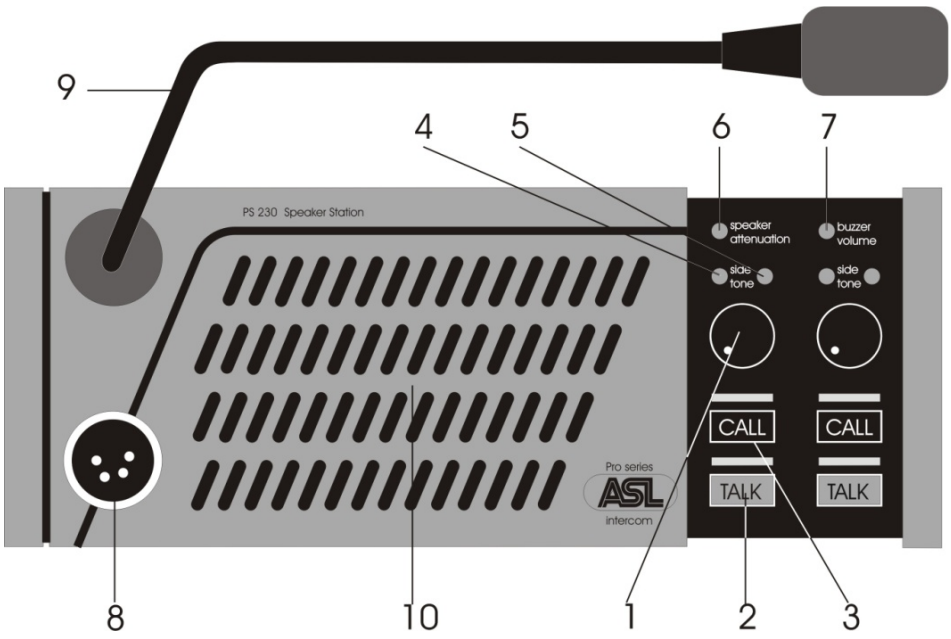
2.0 INSTALLATION

Connect the intercom party lines to the LINE connectors on the side panel of the PS 230. The necessary DC voltages are derived from a master station or a separate power supply, via the intercom connection cables. Use professional microphone cable with 2 wires and 1 shield only.

The PS 230 is fully protected against wiring mistakes (reverse power) or short circuit in the interconnecting cables.

A kit is available for mounting the PS 230 in a 19" rack, taking 2U of rack space.

3.0 FRONTPANEL CONTROLS & CONNECTORS



1 VOLUME control knobs
To adjust the listen level for the headset and the loudspeaker.

2 TALK buttons
To activate the gooseneck or headset microphone. The large green LEDs indicate if the microphone is 'on'.

Momentary switching:
If a TALK button is pushed and held, the microphone signal is sent to the corresponding intercom channel until the button is released.

Latched switching:
If a TALK button is pushed shortly it is electronically latched and the microphone signal is sent to the corresponding intercom channel. If pushed again, the TALK button switches off.

Mic Mute if latched on:
After on the intercom channel a so-called MIC Mute signal has been received from a PRO Series master station or separate power supply, the connection between microphone and intercom channel is interrupted. By pushing the TALK button the connection is restored again.

3 CALL buttons
These push buttons (one for each channel) activate the call system.
By a momentary push a visual call signal is sent to all stations connected to the corresponding intercom channel and the call LEDs start flashing. By holding a CALL button pushed for 2 seconds the call buzzer is activated, provided there is no 'buzzer mute' on one or both intercom channels. After the CALL button is released the LEDs continue to flash for a further 2 seconds.

4 SIDE TONE LEVEL trimmers
These trimmers, one for each channel, are for minimizing the speaker feeding back into the gooseneck microphone (unit feedback). They also determine the level of your own voice as you hear it in the speaker or headset.

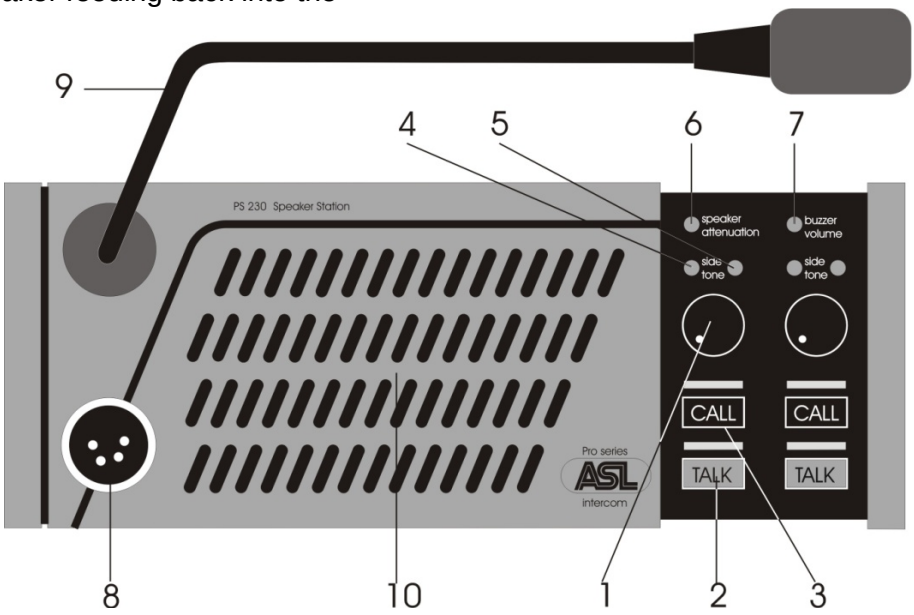
5 SIDE TONE HI trimmers
These trimmers, one for each channel, have the same purpose as trimmer #5, but solely for the high frequencies.

Adjustment procedure for both side tone trimmers, for each channel separately:

- set trimmer in start position: fully clockwise
- switch off the microphones of all connected (speaker) stations
- make sure there is no automatic speaker attenuation (turn trimmer #6 fully clockwise)
- push the TALK button of the corresponding channel
- slowly turn up the listen volume
- speak into the gooseneck microphone
- adjust the speaker listen level of the corresponding channel to a minimum by turning the side tone trimmers counter clockwise (first trimmer #4 and then trimmer #5; repeat this a few times)
- Connect a headset to the PS 230 (the speaker and gooseneck mic are now automatically disabled) and speak into the headset microphone
- Check whether the level of your voice in the headset can(s) is sufficient. If not, push up the listen level of the corresponding channel a bit by turning side tone trimmer #4 clockwise.

The trimmers operating area is between fully clockwise and minimum level.

Adjusting the side tone does not affect the level of your voice as it is heard by other stations.



6 SPEAKER ATTENUATOR trimmer

To adjust the extent to which the speaker is automatically dimmed if the gooseneck microphone is switched on. It prevents unit feedback if side tone rejection is not sufficient. It also minimizes system feedback or a 'hollow' sound when the gooseneck microphones of other speaker stations on the intercom channel are switched as well.

Adjustment procedure :

- make sure there is no headset connected
- feed an audio signal into one of the intercom channels (via an AUX input on a master station or a separate power supply)
- turn up the listen volume
- activate the gooseneck microphone
- adjust the desired degree of speaker attenuation (turning the trimmer counter-clockwise increases the attenuation)

7 BUZZER VOLUME trimmer

To adjust the volume of the internal buzzer. The buzzer is activated if a CALL button of the PS 230 is pushed (or a CALL button of any other station on a channel to which the PS 230 is connected) longer than 2 seconds, provided there is no 'buzzer mute' on one of the channels.

8 HEADSET connector (XLR-4)

To connect a headset to the unit. The headset can must have an impedance of 200 ohms minimum. When there 2 cans in parallel each can must have an impedance of 400 ohms minimum. The headset microphone may be of the dynamic or electret type.

XLR-4 pin assignments :
Pin 1. Shield mic. (GND)
Pin 2. mic. +
Pin 3. phones +
Pin 4. phones

If a headset is connected, the speaker and gooseneck microphone are disabled automatically.

9 GOOSENECK MICROPHONE

An electret noise canceling gooseneck microphone. A limiter prevents the microphone preamplifier from clipping when speaking close into the microphone

10 LOUDSPEAKER

A high quality 16 Ω loudspeaker

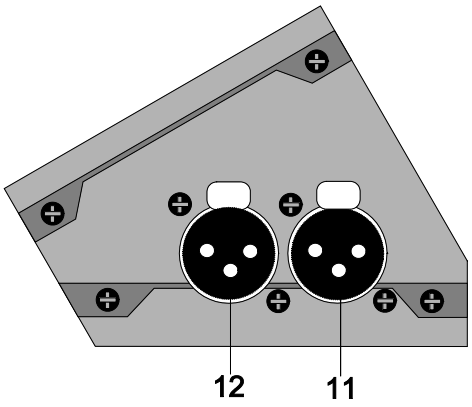
4.0 SIDE PANEL CONNECTORS

11 LINE connector channel A

12 LINE connector channel B

These connectors are for connecting the PS 230 to the party lines of an intercom system.

XLR-3 pin assignments :
1. 0 V /ground shield
2. +30V power wire
3. audio wire



5.0 INTERNAL CONTROLS

Inside the unit there are trimmers to adjust the mic gain of the gooseneck microphone and the headset microphone separately.
The trimmers are located on the PC board.

The trimmers can be reached as follows :

- remove the screws of the bottom plate
- slide the plate to one side and take it out
- take away the plastic isolation plate

The trimmers are labeled :
'GOOSE' for the gooseneck microphone
'HEADS' for the headset microphone

6.0 TECHNICAL SPECIFICATIONS

System Specifications
Dynamic range: 80 dB (1 kHz, THD < 1%)
Frequency response: 200 Hz – 15 kHz (-3dB)
Call signal: (send): +2.8 mA
Call signal threshold (receive): +2.4V DC
Operation voltage: 24 – 32 V DC
Power interrupt time (Mic Mute): 0.1 sec
Line Impedance: 350 Ω (1 kHz), 2.2 kΩ (DC)
Audio level: nom. -18 dBu, max. 0 dBu

Microphone Pre-amps
Gain: 40 – 60 dB (adjustable internally, separately for the headset mic and the gooseneck mic)
Presence filter: +6 dB @ 5 kHz
Power to electret mic: +9V DC
Limiter range (gooseneck mic): 30 dB

Headphone Driver Amp
Max. output level:
normal: 16 V rms (@ 200 Ω
binaural: 2x 10.3 V rms (@ 400 Ω
Max. output power:
normal: 1.3 W rms @ 200 Ω
binaural: 2x 0.27 W rms @ 400 Ω

Speaker Driver Amp
Max. output power: 1.6 W rms @ 16 Ω

Side Tone
Rejection: 0 - 30 dB adjustable

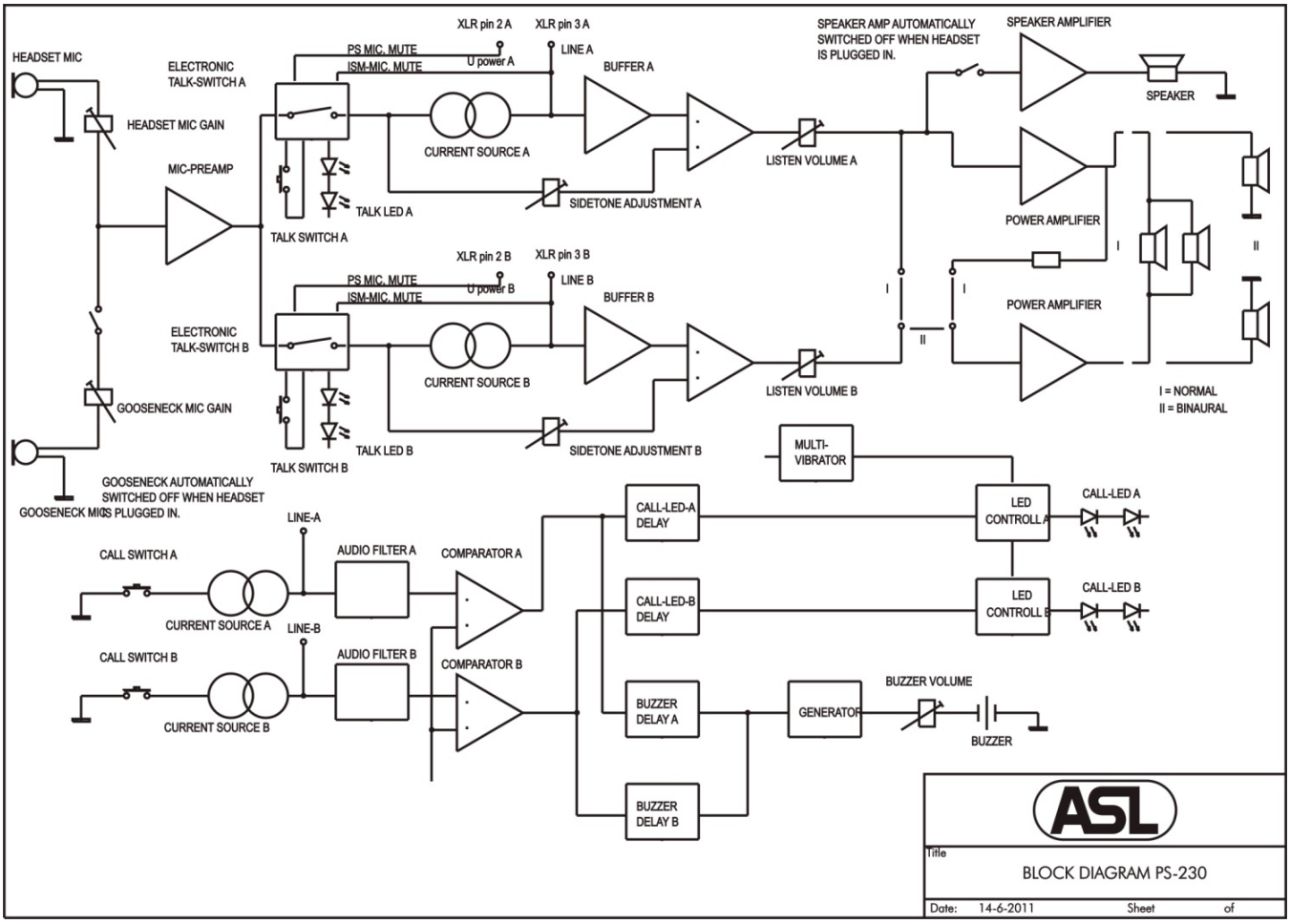
Buzzer
Max. SPL: 85 dBA

PS 230 Power Consumption
Current (at 30V DC):
- 35 mA quiescent
- 70 mA signaling
- 190 mA at max. output + signaling

PS 230 Dimensions & Weight
Width 230 mm
Height 88 mm
Depth 42/48 mm sloping
Weight 1.3 Kg

0 dBu is defined as 775 mV into open circuit
ASL reserves the right to alter specifications without prior notice.

7.0 PS 230 BLOCK DIAGRAM



8.0 PARTY LINE, TECHNICAL CONCEPT

User stations in an ASL intercom system are connected via one or several 'party lines'. A party line offers two way ('full duplex') communication and consist of standard microphone (multi-pair) cable. One wire is used as an audio line, one as a power line and the screen of the cable functions as earth/return.

Current drive is used for signal transfer. Each station utilizes a current amplifier to amplify the microphone signal and place it on the common audio line where, due to the constant line impedance, a signal voltage is developed which can be further amplified and sent to headphones or loudspeakers.

This principle has three advantages:

1. the use of a single audio line allows several stations to talk and listen simultaneously
2. due to the high bridging impedance offered by each station, the number of stations on the party line has no influence on the level of the communications signal
3. power and audio to the intercom stations use the same cable.

The Call signal is also sent as a current on the audio line. It develops a DC potential over the line impedance which is sensed by each station and interpreted as a Call signal.

9.0 CABLING

The intercom lines (the 'party lines') are of the shielded two-conductor microphone cable type. The intercom line connectors are of the XLR-3 type. Audio and Call signals are on pin 3, DC power is on pin 2 and pin 1 is connected to the shield of the cable which functions as the common return for audio and power.

The audio signal is transferred in an unbalanced way (see Party Line, Technical Concept). To avoid earth loops (hum), the possible effect of electromagnetic fields and to minimize power loss, certain rules have to be obeyed when installing the cabling of an ASL intercom system.

Use high quality cable
Use high quality microphone cable (shielded two conductor cable, minimum 2x 0.30 mm2).
In case multi-pair cable is used, each pair should consist of two conductors (minimum 2x 0.15 mm2) with separate shield and an overall shield.

Use flexible cable
Use flexible single and multi-pair microphone cable instead of cable with solid cores, especially when the cable is subjected to bending during operation or installation.

Cable screens to XLR pin 1
The screen of each separate microphone cable and/or the screen of each single pair in a multi-pair cable, should be connected to pin 1 of each XLR-3 connector. Do not connect this cable screen to the metal housing of ASL units or XLR-3 wall boxes.
See section 'Earthing Concept'.

Connect cable trunks, connection boxes and overall multi-pair cable screens to clean earth
Metal cable trunks, metal wall boxes and overall multi-pair cable screens should be interconnected and, at the 'central earth point' in the intercom network only, be connected to a clean earth or a safety earth.
See section 'Earthing Concept'.

Keep metal connection boxes and cable trunks or pipes isolated from other metal parts
Metal trunks or pipes for intercom cables and metal connector boxes should be mounted in such a way that they are isolated from any other metal housing or construction part.

Keep cables parallel as much as possible
When two (multi channel) units in a network are connected by more than one cable, make sure that these cables are parallel to each other over the whole distance between those units. When using multi-pair cable, parallelism is ensured in the best possible way.

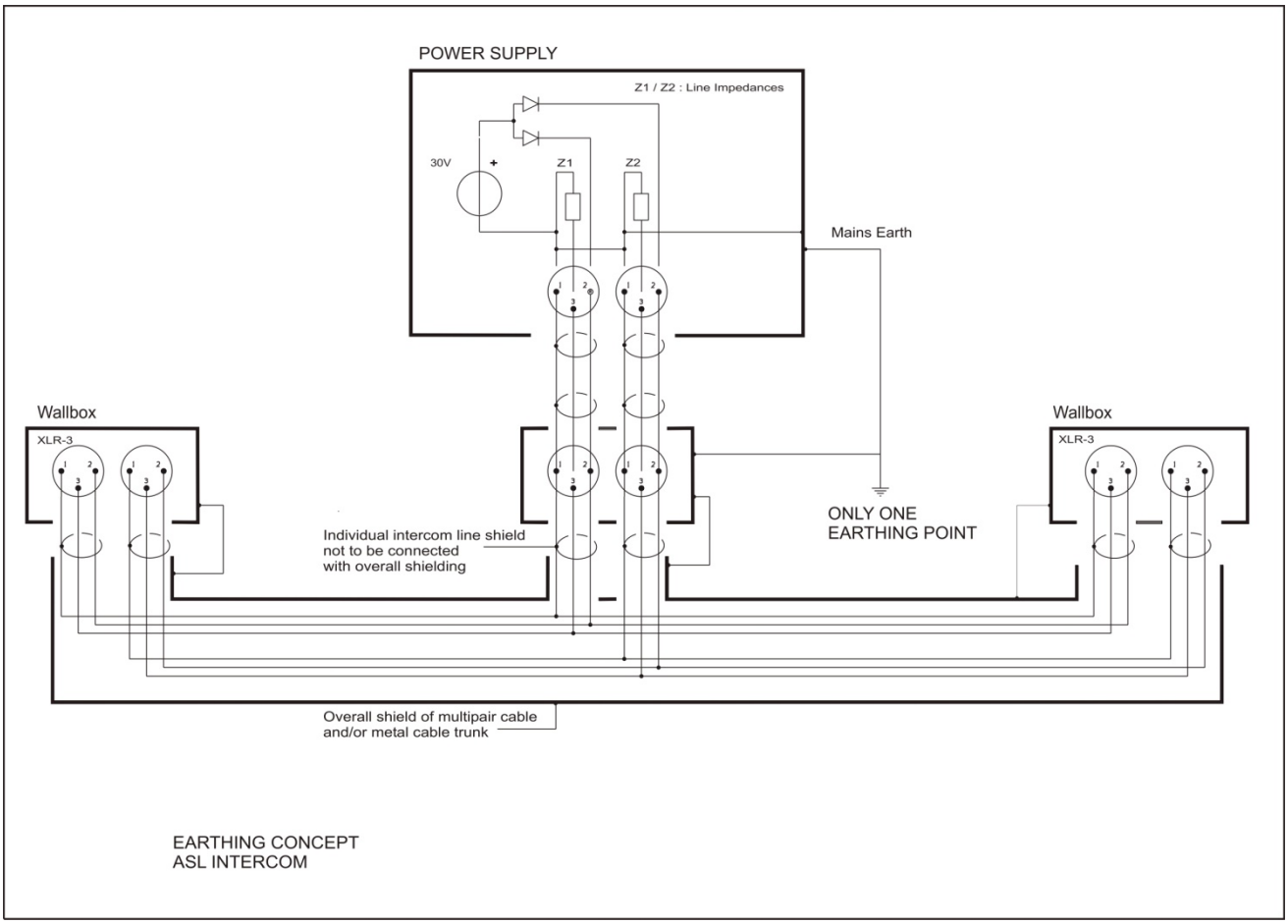
Avoid closed loops
Always avoid that cables are making a loop. So-called 'ring intercom' should not physically be cabled as a ring.

Keep cables away from electromagnetic sources
Keep intercom cables away from high energy cables, e.g. 115/230/400V mains power or dimmer controlled feeds for spotlights. Intercom cables should cross high energy cables at an angle of 90º only. Intercom cables should never be in the same trunks as energy cables.

Place power supply in a central position
In case of a system powered by a separate power supply: In order to diminish power losses, place the power supply as close as possible to where most power consumption occurs, in other words most user stations are placed.

ASL powered units to a 'clean' mains outlet
Master stations or power supplies should be connected to the mains outlet with a clean earth. Other (audio) equipment may be connected to this outlet, but avoid using an outlet which also powers dimmer controlled lighting systems.

10.0 EARTHING CONCEPT



11.0 SYSTEM CONFIGURATION